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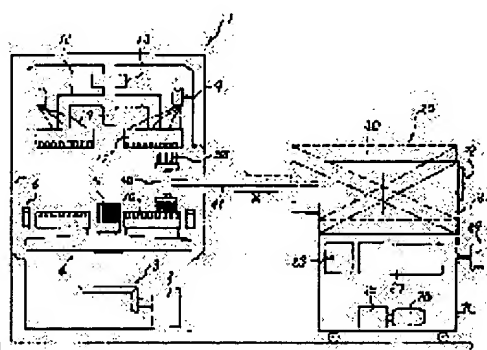
(54) WASHING DEVICE FOR SURFACE PLATE OF DOUBLE POLISHING MACHINE

(57)Abstract:

PURPOSE: To remove polishing wastes, a polishing material, and the like from the grooves of surface plates, and to carry out the washing work automatically, by inserting a nozzle device between the upper and the lower surface plates without removing the surface plates of a double polishing machine, and injecting a high pressure water from a nozzle to a polishing surface.

CONSTITUTION: A double polishing machine 1 is composed as a device to polishing process the upper and the lower surfaces of a work by setting the work between the upper and the lower surface plates 10 and 11. A nozzle device 40 is inserted between the upper and the lower and surface

plates and a high pressure water is injected while the nozzle device is reciprocated in the radial direction of the surface plates, so as to carry out the removing work of polishing wastes and a polishing material entered in the surfaces and the grooves of the surface plates. And around the nozzle of the nozzle device 40, brush members 58



are provided, so as to prevent the scattering of the water to the surroundings. To a washing device 20 to hold the nozzle device 40, a driving means to reciprocate a pipe 41, a pump 26 to feed the high pressure water, and the like are provided, and the washing work is carried out automatically.

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CLAIMS

[Claim(s)]

[Claim 1] While making an up surface plate and a lower surface plate counter, arranging, arranging the carrier which supports a workpiece between the polished surfaces which the two aforementioned surface plates counter and making opposite direction rotate the two aforementioned surface plates through a normal axis In the double-sided grinder which grinds the field of the upper and lower sides of a workpiece in parallel while making the carrier holding a workpiece revolve around the sun While constituting the mechanism in which high-pressure water is made to blow off from the nozzle which arranges possible [movement of nozzle equipment] between the surface plates of the upper and lower sides of the aforementioned double-sided grinder, and is arranged to the upper and lower sides of the aforementioned nozzle equipment and rotating the surface plate of the aforementioned double-sided grinder The washing station of the double-sided grinder surface plate which both-way movement of the nozzle equipment is made to carry out in the direction of a radial to a surface plate, and is characterized by removing the polish waste which remains into the slot on the surface plate with the high-pressure water which blows off from the aforementioned nozzle.

[Claim 2] The washing station of the double-sided grinder surface plate according to claim 1 characterized by to make the edge of the pipe which prepares a means set up the height of the supporter material of nozzle equipment, a means carry out both-way movement of the nozzle equipment, and a means turn high-pressure water to nozzle equipment, and supply it in the washing station which forms the aforementioned nozzle equipment, and is connected to a both-way move means support the aforementioned nozzle equipment.

[Claim 3] The washing station of the double-sided grinder surface plate according to claim 1 or 2 characterized by preparing at one the scattering prevention means of the water which has arranged the covering member, respectively focusing on the nozzle prepared in the upper and lower sides of the aforementioned nozzle equipment, and washed the polished surface of a surface plate in the aforementioned covering member.

[Claim 4] The washing station of the double-sided grinder surface plate according to claim 3 characterized by for a brush-like member constituting the scattering prevention means of water prepared in the aforementioned covering member, and making the protrusion height of the member of the shape of an aforementioned brush equivalent to the interval of a nozzle and a polished surface, and constituting it.

[Claim 5] a means to supply high-pressure water to nozzle equipment at the aforementioned washing station -- in addition, the nozzle prepared in another object -- the washing station of the double-sided grinder surface plate according to claim 1 characterized by establishing a means to supply high-pressure water to a member etc.

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 CLAIMS

[Claim(s)]

[Claim 1] While making an up surface plate and a lower surface plate counter, arranging, arranging the carrier which supports a workpiece between the polished surfaces which the two aforementioned surface plates counter and making opposite direction rotate the two aforementioned surface plates through a normal axis In the double-sided grinder which grinds the field of the upper and lower sides of a workpiece in parallel while making the carrier holding a workpiece revolve around the sun While constituting the mechanism in which high-pressure water is made to blow off from the nozzle which arranges possible [movement of nozzle equipment] between the surface plates of the upper and lower sides of the aforementioned double-sided grinder, and is arranged to the upper and lower sides of the aforementioned nozzle equipment and rotating the surface plate of the aforementioned double-sided grinder The washing station of the double-sided grinder surface plate which both-way movement of the nozzle equipment is made to carry out in the direction of a radial to a surface plate, and is characterized by removing the polish waste which remains into the slot on the surface plate with the high-pressure water which blows off from the aforementioned nozzle.

[Claim 2] The washing station of the double-sided grinder surface plate according to claim 1 characterized by to make the edge of the pipe which prepares a means set up the height of the supporter material of nozzle equipment, a means carry out both-way movement of the nozzle equipment, and a means turn high-pressure water to nozzle equipment, and supply it in the washing station which forms the aforementioned nozzle equipment, and is connected to a both-way move means support the aforementioned nozzle equipment.

[Claim 3] The washing station of the double-sided grinder surface plate according to claim 1 or 2 characterized by preparing at one the scattering prevention means of the water which has arranged the covering member, respectively focusing on the nozzle prepared in the upper and lower sides of the aforementioned nozzle equipment, and washed the polished surface of a surface plate in the aforementioned covering member.

[Claim 4] The washing station of the double-sided grinder surface plate according to claim 3 characterized by for a brush-like member constituting the scattering prevention means of water prepared in the aforementioned covering member, and making the projection height of the member of the shape of an aforementioned brush equivalent to the interval of a nozzle and a polished surface, and constituting it.

[Claim 5] a means to supply high-pressure water to nozzle equipment at the aforementioned washing station -- in addition, the nozzle prepared in another object -- the washing station of the

double-sided grinder surface plate according to claim 1 characterized by establishing a means to supply high-pressure water to a member etc.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the equipment it enables it to do automatically the work which removes the grinding waste which remains into the slot on the surface plate, and abrasives by making high-pressure water blow off to workpieces, such as glass, a metal plate, crystal, and a silicon wafer, to the polished surface of the surface plate especially arranged to the upper and lower sides of a double-sided grinder about the washing station which does the pure work of a surface plate in the double-sided grinder which carries out grinding in parallel using a surface plate.

[0002]

[Description of the Prior Art] In order to finish the field of the upper and lower sides, such as a glass plate, and a silicon wafer, a metal plate, in parallel, using and processing a double-sided grinder conventionally is performed. In the aforementioned double-sided grinder, as shown in JP,60-12691,Y etc., as a workpiece is inserted from the upper and lower sides, two surface plates are arranged, and it is made to perform processing to which the field of the upper and lower sides of a workpiece becomes parallel, driving to opposite direction through the normal axis which supports the aforementioned surface plate, for example. In the aforementioned double-sided grinder, as shown in drawing 7, establish many slots 16 and 17 in every direction in a polished surface 15, constitute a surface plate 10, on the other hand, made ** rotate the aforementioned surface plate 10, the polished surface of the aforementioned surface plate was made to correspond, and the carrier 7 which supports a workpiece 8 is arranged, for example.

[0003] Moreover, as the polished surface 15 of the aforementioned surface plate is shown in drawing 8, the trench is prepared, the width of face H of the aforementioned slot 16 is formed in about 1mm, depth-of-flute D is set as about 10-15mm, and polish waste, water, etc. may be eliminated through the aforementioned slot. And it enables it to grind the front face of a workpiece, engaging the gear prepared in the circumference of the aforementioned carrier 7 on the gear of the inside gear 5 and the outside gear 6, and rotating a workpiece to a surface plate. It is made to do the work which grinds the field of the upper and lower sides of a workpiece so that it may become parallel with a surface plate, arranging the surface plate which formed the aforementioned polished surface 15 to the upper and lower sides of a workpiece, arranging in the state where two surface plates touch lightly to a workpiece, and supplying water, abrasives, etc. for polish.

[0004]

[Problem(s) to be Solved by the Invention] Since polish waste, abrasives, etc. remain in the slot on the surface plate after working polish of a workpiece with the aforementioned surface plate, after the end of work, a surface plate is removed from a double-sided grinder, and to remove polish waste etc. from the slot on the surface plate is needed. However, width of face is formed deeply very narrowly, and since only solidification has polish waste, abrasives, etc. which entered the slot in a beam state, the slot established in the polished surface of a surface plate has the problem of being easily unremovable from a slot. Then, although a means which inserts a metal plate member with width of face narrower than before into a slot, and rakes out polish waste etc. is used, since there are very many slots in every direction established in the polished surface of a surface plate, much time is needed for pure work and there is a fault of forcing it the work which is not efficient. Furthermore, in the state of removing neither abrasives nor polish waste completely out of the slot on the surface plate, when the next polish work is done, the time which polish takes is long, the polished surface of the workpiece which the lump of polish waste is grinding to bird clapper others is touched, a polished surface is damaged or damaging and fully doing the pure work under polish and after work is called for in many cases.

[0005]

[Objects of the Invention] this invention solves the problem of the pure work of a surface plate which was mentioned above, injects high-pressure water from nozzle equipment to the polished surface of the surface plate which countered up and down and has been arranged, and it aims at offering the washing station of the double-sided grinder surface plate which enables it to prevent that water disperses around while it enables it to remove automatically the polish waste which entered the slot.

[0006]

[Means for Solving the Problem] It relates to the washing station to the double-sided grinder which grinds the field of the upper and lower sides of a workpiece in parallel, making the carrier holding a workpiece revolve around the sun while this invention makes an up surface plate and a lower surface plate counter, arranging it, arranging the carrier which supports a workpiece between the polished surfaces which the two aforementioned surface plates counter and making opposite direction rotate the two aforementioned surface plates through a normal axis. While constituting the mechanism in which high-pressure water is made to blow off from the nozzle which arranges possible [movement of nozzle equipment] between the surface plates of the upper and lower sides of the aforementioned double-sided grinder, and is arranged to the upper and lower sides of the aforementioned nozzle equipment in this invention and rotating the surface plate of the aforementioned double-sided grinder Both-way movement of the nozzle equipment is made to carry out in the direction of a radial to a surface plate, and the mechanism in which the high-pressure water which blows off from the aforementioned nozzle removes the polish waste which remains into the slot on the surface plate is constituted.

[0007] Moreover, a means to set up the height of the supporter material of nozzle equipment, a means to carry out both-way movement of the nozzle equipment, and a means to turn high-pressure water to nozzle equipment, and to supply it can be prepared in the washing station which arranges the aforementioned nozzle equipment, and the edge of the pipe connected to a both-way move means can be made to support the aforementioned nozzle equipment in this invention. Furthermore, in this invention, a covering member can be arranged focusing on the nozzle prepared in the upper and lower sides of the aforementioned nozzle equipment, and the scattering prevention means of the water which washed the polished surface of a surface plate

can be prepared in the aforementioned covering member at one. In addition to the aforementioned composition, a brush-like member constitutes the scattering prevention means of water prepared in the aforementioned covering member, and the protrusion height of the member of the shape of an aforementioned brush can be made equivalent to the interval of a nozzle and a polished surface, and can be constituted. In this invention furthermore, to the aforementioned washing station As opposed to a member etc. a means to supply high-pressure water to nozzle equipment -- in addition, the nozzle linked to another object -- By using the hand shower gun which could also constitute a means to supply high-pressure water, for example, prepared the member of the shape of a nylon brush as a water scattering prevention means A means to perform washing easily can consist of nozzle members which wash the polished surface of a surface plate also to the member which cannot be washed.

[0008]

[Function] In the washing station of the double-sided grinder surface plate of this invention, after the polish work to a workpiece is completed, while opening a predetermined interval and inserting nozzle equipment between up-and-down surface plates, from a washing station, high-pressure water is turned to nozzle equipment, and is sent out. And while rotating a surface plate at a low speed, a both-way drive is carried out in the direction which nozzle equipment is made to haunt from a washing station, the high-pressure water of about 50-100 atmospheric pressure is injected from a polish nozzle, and it is made to do the work which removes the polish waste which has entered the slot on the surface plate. On the occasion of the removal work of the polish waste etc., it can work automatically by covering the circumference of a nozzle by the covering member by being able to prevent that high-pressure water disperses around, not soiling the circumference of a double-sided grinder, and setting up control information required for the control unit of a washing station.

[0009]

[Example] According to the example illustrated, the washing station of the double-sided grinder surface plate of this invention is explained. The example shown in drawing 1 shows the case where washing to the polished surface of a surface plate is performed combining a washing station 20 to the double-sided grinder 1. The thing of the same mechanism as the equipment generally used is being used for the aforementioned double-sided grinder 1, and it constitutes the mechanism in which the polish to a workpiece is worked, between the up surface plate 11 and the lower surface plate 10 using a surface plate as shown in aforementioned drawing 7. The aforementioned lower surface plate 10 is supported by the support board 4, and rotates horizontally at the rate of predetermined through a driving gear 3 from a motor 2. Moreover, the lower surface plate 10 is supported by the surface plate supporter material 12 from the equipment bottom, it is formed so that the interval to the lower surface plate 10 can be set up with the equipment 13 for the upper and lower sides, while arranging to the core of the aforementioned lower surface plate 10, it connects the gear 14 for linkage to a gear 5, and it is made to make opposite direction rotate an up-and-down surface plate mutually. Furthermore, while arranging to the core of the aforementioned lower surface plate 10, a gear 5 and the gear arranged in the periphery section of the carrier 7 as shown in drawing 7 to the outside gear 6 arranged in the periphery section are engaged, and polish processing is performed in the state where the carrier was made to support a workpiece.

[0010] After the aforementioned double-sided grinder 1 performs polish processing of a workpiece, in order to remove polish waste and abrasives which entered the slot on the surface

plate, as shown in aforementioned drawing 1 , the interval of the up-and-down surface plates 10 and 11 is opened, nozzle equipment 40 is inserted among both surface plates, and it is made to perform washing by high-pressure water. The washing station 20 of this invention has prepared a motor 25, high pressure pumping 26, and the receiver-tank 27 grade in the interior of the main part of equipment, in order to have formed nozzle equipment 40 through the pipe 41 from the flank of the main part 21 of equipment and to supply high-pressure water to the aforementioned nozzle equipment 40. It may be made to make it the water accumulated by the aforementioned high pressure pumping at a receiver tank blow off from a nozzle by pressures for example, with 50 to 100 arbitrary atmospheric pressure, and enables it to set up arbitrarily the water pressure injected to a surface plate. Moreover, in order to set up the work height of the aforementioned nozzle equipment 40, the handle 29 of a vertical-movement operation is formed, the height of up equipment 30 is changed manually, and the height of nozzle equipment is set up arbitrarily. Furthermore, a control panel 22 is arranged to the position of equipment, and it enables it to input into it the control information over the control unit 23 formed in the main part of equipment.

[0011] The composition of the aforementioned washing station 20 is constituted as shown in drawing 2 and 3, and the feeder style of the aforementioned high-pressure water is arranged, and it is made support the up equipment 30 which supports nozzle equipment 40 through vertical-movement equipment 28 in the base of the main part 21 of equipment, and to operate a pantograph-like vertical-movement mechanism by rotation of a handle 29 in the example illustrated to it. The nozzle driving gear 31 as shown in the up equipment 30 of a washing station at drawing 3 is formed, and it is made to perform the drive for carrying out both-way movement to the pipe 41 which supports nozzle equipment 40 according to the control information inputted through the control panel 22. the rod 33 which drives the aforementioned nozzle driving gear 31 by the motor 32 -- linkage -- it connects with the edge of a pipe 41 through a member 35, and the guide shaft 34 is met -- making -- the aforementioned linkage -- the mechanism in which a member 35 is guided is constituted And washing to a surface plate can be performed using nozzle equipment 40 by carrying out both-way movement in the range which had the rod 33 set up by the aforementioned motor 32. the guide-idler equipment 38 formed in the interior 37 of the nose-of-cam proposal which arranges the pipe 41 for supplying high-pressure water to the point of up equipment 30 while supporting the aforementioned nozzle equipment 40, and packing -- a member 39 and the support means which omitted illustration show around, and on the occasion of both-way movement of nozzle equipment 40, it is constituted so that Bure etc. may not arise

[0012] The thing of composition as shown in drawing 4 can be used for the nozzle equipment 40 held at the point of the aforementioned pipe 41. Nozzles 51 and 61 are arranged up and down to a nozzle body 42, and the high-pressure water injected from each nozzles 51 and 61 enables it to perform washing to the polished surface of an up-and-down surface plate in the nozzle equipment 40 shown in aforementioned drawing 4 . The nozzle of the aforementioned upper and lower sides was made to correspond, and the upper washing section 50 and the lower washing section 60 are arranged, respectively, and let the washing sections 50 and 60 of the aforementioned upper and lower sides be the things of the almost same composition. Then, if the upper washing section 50 which arranges the composition of the washing section of the aforementioned upper and lower sides corresponding to the up surface plate 11 is made into an example and explained, the aforementioned nozzle 51 sets the injection range of the water spouted from the high-pressure water exhaust nozzle 52 as an angle θ , and it constitutes it so

that the angle theta can be adjusted arbitrarily.

[0013] moreover, the circumference of the aforementioned nozzle 51 -- covering -- a member 54 is arranged and a means to prevent that water disperses around is constituted the aforementioned covering -- the disk which arranges a member 54 in the tubed part 55 fixed to the base of a nozzle 51 through the stop section 56, and its upper part -- a member 57 -- constituting -- the aforementioned disk -- the periphery section of a member 57 -- a brush -- the member 58 is formed the aforementioned brush -- a member 58 is shown in drawing 5 using that to which the size has arranged the nylon whose length is about 10cm by predetermined density at about 1mm -- as -- a center [nozzle / 51] -- carrying out -- a disk -- it is arranged in the shape of a ring by predetermined width of face at the periphery section of a member in addition, the aforementioned brush -- since the high-pressure water which blows off from a nozzle prevents dispersing around on the contrary in the slot and polished surface of a surface plate, a member 58 can change suitably conditions, such as density, length width of face, etc. of a brush, according to conditions, such as water pressure injected from a nozzle furthermore, the covering member prepared in the washing-on the above section 50 -- setting -- a disk -- a member 57 -- receiving -- the hole for drainage -- 59 is prepared, and the water used for cleaning is turned to the lower part, and it enables it to be drained

[0014] the nozzle 61 of the composition same in the lower washing section 60 which is made to counter the washing-on the above section 50, and is arranged in the lower part of a nozzle body 42 as the case of the washing-on the above section, and covering -- the member 64 is arranged and the high-pressure water spouted from the aforementioned nozzle 61 is made to perform the cleaning operation to the lower surface plate 10 moreover, the aforementioned covering -- the disk which constitutes a member 64 -- it is not necessary to arrange opening, the water injected from a nozzle can be poured on the front face of the lower surface plate 10, and a member 67 can be made to eliminate from the circumference furthermore, the degree theta of spray angle of the water made to blow off from the exhaust nozzle 62 of a nozzle 61 also in the washing-under the above section 60 -- suitably -- it can set up -- covering -- the disk of a member -- the brush formed in a member 67 -- the composition of a member 68 can also be made to be able to respond to water pressure etc., and can be set up arbitrarily

[0015] As mentioned above, when performing washing to the surface plate of the double-sided grinder 1 using the constituted nozzle equipment 40, after grinding a workpiece with the double-sided grinder 1, it can clean without removing a surface plate. That is, when the polish work to a workpiece is completed and a surface plate needs to be cleaned, as shown in drawing 1 , to the lower surface plate 10 arranged to a fixed position, the up surface plate 11 is raised using the equipment 13 for the upper and lower sides, and a means to connect the inside gear 5 of a driving gear 3 and the gear 14 for linkage of the up surface plate 11 is arranged. Furthermore, the height of the up equipment of a washing station 20 is set up, and the moving range of nozzle equipment is inputted through a control panel 22 so that nozzle equipment 40 can be positioned among the surface plates 10 and 11 of the aforementioned upper and lower sides. And while rotating an up-and-down surface plate at a low speed, operating the high-pressure water supply means of the aforementioned washing station 20, and injecting high-pressure water from a nozzle, it is made to perform washing, making the shape of a straight line carry out both-way movement of the nozzle equipment 40 in the direction of a radial between the center of a surface plate, and the periphery section. Therefore, in case washing of the surface plate by the aforementioned washing station is performed, polish waste, abrasives, etc. which enter into the trench of a surface plate

and are solidified can be eliminated with water pressure by making very high-pressure water inject from a nozzle.

[0016] in addition -- since the bulb 19 for high-pressure water supply is arranged to the main part of equipment in the equipment of this invention as shown in drawing 2 -- the aforementioned bulb 19 -- receiving -- a rubber hose -- connecting -- the rubber hose -- a high-pressure water-injection nozzle -- another cleaning meanses, such as a member, are connectable the hose 74 which can constitute hand gun equipment 70 as shown in drawing 6 , and is connected to the aforementioned bulb 19 to the main part 71 of equipment, for example as a high-pressure water-injection nozzle member prepared in another object as mentioned above -- arranging -- a valve action -- a member 72 -- using -- a pipe -- it is made make high-pressure water inject from the nozzle 76 of the nozzle equipment 75 arranged at the nose of cam of a member 73

[0017] moreover, the circumference of a nozzle is covered with the aforementioned nozzle equipment 75 -- as -- the brush as a water scattering prevention member -- a member 78 -- arranging -- **** -- the aforementioned brush -- that to which the size of nylon transplanted hair in the circle configuration focusing on the nozzle 76 as a member 78 in the fiber which is 1-3mm at the support plate 77 is used furthermore, the pipe of the aforementioned hand gun equipment 70 -- the point of a member 73 -- an angle theta -- bending -- the point -- a nozzle -- a member 75 is arranged and it enables it to perform washing easily angle-of-bend theta of the aforementioned pipe -- 130-150 degrees -- setting up -- the circumference of the bending section -- reinforcement -- while raising the operability at the time of arranging a member 79, injecting high-pressure water from a nozzle 76, and performing washing -- a nozzle -- it enables it to support a member good And washing by high-pressure water can be performed to other members which cannot be washed with the nozzle equipment 40 of the aforementioned main part other than washing a surface plate, for example, the front face of the gear tooth of an inside gear or an outside gear, and the portion into which others became dirty using the aforementioned hand gun equipment 70. Moreover, the water pressure of the high-pressure water supplied through the aforementioned bulb 19 can be adjusted arbitrarily, and can make water inject with low water pressure rather than the case where the nozzle equipment of a main part is used, by adjusting the aperture of a bulb. Therefore, by using the nozzle attached in the aforementioned exception object, a floor, a wall, etc. of a work place can be cleaned other than members other than the surface plate of a grinder, or the portion around a surface plate, and washing of that etc. can be performed easily.

[0018] Moreover, with the equipment of this invention, when the pressure of the high-pressure water injected from a nozzle is high, or when scattering of water cannot be prevented only by the brush member, the circumference of a surface plate can also be covered by the covering member of another object. being able to use arbitrary members as a member which covers the circumference of the aforementioned surface plate, and twisting the thing of the shape of a comparatively thick sheet of nylon around the periphery section of an up surface plate and a lower surface plate, for example, arranging in the shape of a skirt board -- constituting -- up-and-down covering -- the crevice which is the grade which can pass nozzle equipment 40 can also be formed between members In this invention, a brush-like member can be twisted around the periphery section of a surface plate other than the aforementioned covering means, and a means to prevent that high-pressure water spouts to the exterior of a surface plate can be constituted. furthermore, in the equipment of this invention, it is made to correspond to the depth of flute of a surface plate, a property of abrasives, etc. which are used for a double-sided grinder, and the water pressure injected from a nozzle can be set up and it corresponds to the water pressure --

making -- covering -- the composition of a member etc. can be formed arbitrarily

[0019]

[Effect of the Invention] Without removing a surface plate from a double-sided grinder, since the washing station constituted as mentioned above is used, the washing station of the double-sided grinder surface plate of this invention can open the interval of an up-and-down surface plate, and can perform washing easily using nozzle equipment. Moreover, in the washing station of this invention, it is possible to perform washing to a surface plate automatically by setting up the moving range of nozzle equipment, and with the high-pressure water which blows off from a nozzle, while being able to wash the interior of the slot on the surface plate easily, as compared with the case where the interior of a slot is washed, washing can be performed in a short time using a special manual tool etc. Furthermore, since a means to prevent that the water injected to the surface plate disperses around with the nozzle equipment of this invention is established, after being able to prevent that high-pressure water disperses around, a work site's not becoming dirty and a worker's setting a washing station during washing, it makes it possible to work automatically.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is explanatory drawing showing the state where the washing station of this invention was combined with the double-sided grinder.

[Drawing 2] It is the side elevation showing the composition of the washing station of this invention.

[Drawing 3] It is the plan of a washing station.

[Drawing 4] It is explanatory drawing showing the composition of the nozzle equipment of this invention.

[Drawing 5] It is explanatory drawing of the upper washing section.

[Drawing 6] It is explanatory drawing showing the composition of the hand gun used for this invention.

[Drawing 7] It is explanatory drawing showing the composition of the surface plate in a common double-sided grinder, and a workpiece.

[Drawing 8] It is the cross section of a surface plate.

[Description of Notations]

1 Double-sided Grinder 5 Inside Gear 6 Outside Gear, 7 A carrier, 10 Lower surface plate 11 Up surface plate, 15 A polished surface, 16-17 Slot 20 Washing station, 26 High pressure pumping, 30 Up equipment 31 Nozzle driving gear, 32 A motor, 37 The interior of a nose-of-cam proposal 40 Nozzle equipment, 41 A pipe, 50 Top washing section 41 Top nozzle, 54 Arm-top-cover equipment, 57 Disk member 58 Brush member, 60 The bottom washing section and 61 Bottom nozzle 64 Discharge-ring equipment 68 A brush member and 70 Hand gun equipment 75 Nozzle equipment 76 a nozzle and 78 brushes -- member

[Translation done.]